

SN 09/776,086
Docket No. S-91,756
In Response to Office Action dated June 27, 2005

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): Apparatus for processing materials in an atmospheric pressure radio-frequency non-thermal plasma comprising:

an electrically conductive enclosure defining an interior space with a surface and openings for introductions of a gas and for entry and exit of a material to be processed while said interior space is at or near atmospheric pressure;

an electrode situated inside said interior space and spaced apart from said surface of said interior space a distance sufficient to allow placement of said material to be processed;

a mechanical action for placing said material to be processed inside said interior space on said electrode or between said electrode and said electrically conductive enclosure;

said apparatus enclosed by a grounded casing;

a first radio frequency power supply having a first phase applied between said electrode and said grounded casing; and,

a second radio frequency power supply having a second phase offset from said first phase applied between said electrically conductive enclosure and said grounded casing;

wherein a gas containing a majority of inert gas is introduced into said interior space through said opening for introduction of a gas and ~~a radio-frequency voltage applied between said electrically conductive enclosure and said electrode creates~~ creating an atmospheric pressure plasma in said interior space for processing said material to be processed within said electrically conductive enclosure.

Claim 2 (previously presented): The apparatus as described in Claim 1, wherein said mechanical action for placing said material to be processed comprises a roller.

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Claim 3 (previously presented): The apparatus as described in Claim 1, wherein said gas is comprised of said inert gas and a chemically reactive gas.

Claim 4 (canceled)

Claim 5 (original): The apparatus as described in Claim 3, wherein said inert gas is helium and said chemically reactive gas contains oxygen.

Claim 6 (currently amended): The apparatus as described in Claim 1, wherein said first radio-frequency-voltage phase has a frequency of 13.56 Megahertz.

Claim 7(canceled)

Claim 8 (currently amended): The apparatus as described in Claim 7 1, wherein said second phase is offset from said first phase by up to 180°.

Claim 9 (currently amended): Apparatus for processing materials in an atmospheric pressure radio-frequency non-thermal plasma comprising:

an electrically conductive enclosure defining an interior space with a surface and inlets for a gas and for entry and exit of a material to be processed while said interior space is at or near atmospheric pressure;

an electrode spaced apart from said electrically conductive enclosure and capable of placing said material to be processed inside said interior space between said electrically conductive enclosure and said electrode, said material to be processed being in contact with said electrode;

said apparatus is enclosed by a grounded casing;

a first radio frequency power supply having a first phase applied between said electrode and said grounded casing; and,

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a second radio frequency power supply having a second phase offset from said first phase applied between said electrically conductive enclosure and said grounded casing;

wherein a gas containing a majority of inert gas is introduced into said inlet for gas and a radio frequency voltage applied between said electrically conductive enclosure and said electrode ~~creates~~ creating an atmospheric pressure plasma in said interior space for processing said material to be processed as it said gas passes through said electrically conductive enclosure.

Claim 10 (original): The apparatus as described in Claim 9, wherein said electrode and said electrically conductive enclosure are cylindrically shaped.

Claim 11 (original): The apparatus as described in Claim 9, wherein said electrode is a rotating roller.

Claim 12 (previously presented): The apparatus as described in Claim 9, wherein said gas is comprised of said inert gas and a chemically reactive gas.

Claim 13 (original): The apparatus as described in Claim 12, wherein said inert gas is helium and said chemically reactive gas contains oxygen.

Claim 14 (canceled)

Claim 15 (currently amended): The apparatus as described in Claim 9, wherein said first radio frequency voltage phase has a frequency of 13.56 Megahertz.

Claim 16 (canceled)

Claim 17 (currently amended): The apparatus as described in Claim ~~16~~ 9, wherein said second phase is offset from said first phase by up to 180°.

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Claims 18-25 (canceled)

Claim 26 (New): Apparatus for processing materials in an atmospheric pressure radio-frequency non-thermal plasma consisting of:

an electrically conductive enclosure defining an interior space with a surface and openings for introductions of a gas and for entry and exit of a material to be processed while said interior space is at or near atmospheric pressure;

an electrode situated inside said interior space and spaced apart from said surface of said interior space a distance sufficient to allow placement of said material to be processed;

a mechanical action for placing said material to be processed inside said interior space on said electrode or between said electrode and said electrically conductive enclosure; and,

a radio frequency power supply having a phase applied between said electrode and said electrically conductive enclosure;

wherein a gas containing a majority of inert gas is introduced into said interior space through said opening for introduction of a gas creating an atmospheric pressure plasma in said interior space for processing said material to be processed within said electrically conductive enclosure.

Claim 27 (New): The apparatus as described in Claim 26, wherein said phase has a frequency of 13.56 Megahertz.

Claim 28 (New): The apparatus as described in Claim 26, wherein said electrode and said electrically conductive enclosure are cylindrically shaped.

Claim 29 (New): The apparatus as described in Claim 26, wherein said electrode is a rotating roller.